CONTENTS

Number 1

D. A. ROSE. Soil water: quantities, units and symbols 1

J. ASHWORTH and M. A. F. PYMAN. Reactions of ammonia with soil, III. Sorption of aqueous NH_3 by homoionic soil clays 17

D. BARRACLOUGH and P. H. NYE. The effect of molecular size on diffusion characteristics in soil 29

P. H. NYE and M. RAMZAN. Measurement and mechanism of ion diffusion in soil, X. Prediction of soil acidity gradients in acid-base transfers . . 43

N. J. BARROW and T. C. SHAW. Effects of ionic strength and nature of the cation on desorption of phosphate from soil 53

N. J. BARROW and T. C. SHAW. Effects of solution: soil ratio and vigour of shaking on the rate of phosphate adsorption by soil 67

D. W. ANDERSON. Processes of humus formation and transformation in soils of the Canadian Great Plains 77

B. A. GOODMAN and M. V. CHESHIRE. A Mössbauer spectroscopic study of the effect of pH on the reaction between iron and humic acid in aqueous media 85

G. LONGWORTH, L. W. BECKER, R. THOMPSON, F. OLDFIELD, J. A. DEARING and T. A. RUMMERY. Mössbauer effect and magnetic studies of secondary iron oxides in soils. 93

S. St. J. WARNE and B. D. MITCHELL. Variable atmosphere DTA in identification and determination of anhydrous carbonate minerals in soils . . 111

R. G. STURDY, R. H. ALLEN, P. BULLOCK, J. A. CATT and S. GREENFIELD. Paleosols developed on chalky boulder clay in Essex 117

M. A. STOCKING. Catena of sodium-rich soil in Rhodesia 139

H. P. ROTHBAUM, D. A. McGAVESTON, T. WALL, A. E. JOHNSTON and G. E. G. MATTINGLY. Uranium accumulation in soils from long-continued applications of superphosphate 147

SUDHANSU S. PAL, SUDHAKAR-BARIK and N. SETHUNATHAN. Effects of benomyl on iron and manganese reduction and redox potential in flooded soil 155

M. R. CARTER, G. R. WEBSTER and R. R. CAIRNS. Calcium deficiency in some solonetzic soils of Alberta 161

A. P. HAMBLIN and A. M. POSNER. The use of acetyl acetone as a selective extractant of organically bonded metals in soil 175

LETTER TO THE EDITOR

G. BENIANS: A comment on the paper 'Isotopic exchange of phosphate on some phosphatic compounds' by S. G. de Bussetti, E. A. Ferreiro and A. K. Helmy, *J. Soil Sci.* 28, 610–23 183

Number 2

G. W. COOKE. Some priorities for British soil science 187

N. A. DUNCAN. The moisture regimes of six soil series of the central lowlands of Scotland 215

D. G. M. HALL and F. W. HEAVEN. Comparison of measured and predicted soil moisture deficits 225

R. J. DOWDELL, R. CREES, J. R. BURFORD and R. Q. CANNELL. Oxygen concentrations in a clay soil after ploughing or direct drilling 239

L. C. BELL and H. MIKA. The pH dependence of the surface concentrations of calcium and phosphorus on hydroxyapatite in aqueous solutions . . 247

N. J. BARROW. The description of desorption of phosphate from soil . . 259

N. J. BARROW. Three effects of temperature on the reactions between inorganic phosphate and soil 271

KOJI WADA and ALY ABD-ELFATTAH. Effects of cation exchange material on zinc adsorption by soils 281

K. W. T. GOULDING and O. TALIBUDEEN. Potassium reserves in a sandy clay soil from the Saxmundham experiment: kinetics and equilibrium thermodynamics 291

M. G. KIBBLEWHITE and J. TINSLEY. Soil organic matter studies: extraction with formic acid/dimethyl sulphoxide mixtures and fractionation with Zr(IV) 303

M. V. CHESHIRE, J. M. BRACEWELL, C. M. MUNDIE, G. W. ROBERTSON, J. D. RUSSELL and A. R. FRASER. Structural studies on soil polysaccharide 315

J. M. BRACEWELL, G. W. ROBERTSON and J. LOGAN. Variability of organic matter and exchangeable cations within the A_2 horizon of an iron podzol 327

M. A. F. PYMAN, M. KNUIMAN, T. M. ARMITAGE and A. M. POSNER. Examination of the heterogeneity of amorphous silico-aluminas and allophanes using the electron microprobe 333

S.-I. WADA, A. ETO and K. WADA. Synthetic allophane and imogolite 347

R. J. GILKES and ANCHALEE SUDDHIPRAKARN. Magnetite alteration in deeply weathered adamellite 357

R. K. BELFORD. Collection and evaluation of large soil monoliths for soil and crop studies 363

Books on soil science recently received 375

Number 3

J. A. CURRIE, P. BULLOCK and A. J. THOMASSON. Rothamsted studies of soil structure I. Purpose of the project, soils selected, and general conclusions 377

P. BULLOCK and A. J. THOMASSON. Rothamsted studies of soil structure II. Measurement and characterisation of macroporosity by image analysis and comparison with data from water retention measurements 391

A. C. D. NEWMAN and A. J. THOMASSON. Rothamsted studies of soil structure III. Pore size distributions and shrinkage processes 415

J. A. CURRIE. Rothamsted studies of soil structure IV. Porosity, gas diffusion and pore complexity in dry soil crumbs 441

R. J. B. WILLIAMS. Rothamsted studies of soil structure V. Comparative measurements of density, stability, strength, and water-holding capacity of soils from the Denchworth, Evesham, Ragdale, Hanslope, Salop and Flint series 453

P. F. NORTH. Rothamsted studies of soil structure VI. Assessment of the ultrasonic method of determining soil structural stability in relation to soil management properties 463

F. A. SKINNER. Rothamsted studies of soil structure VII. The effects of incubation on soil aggregate stability 473

G. SPOOR and R. J. GODWIN. Soil deformation and shear strength characteristics of some clay soils at different moisture contents 483

G. P. LAWRENCE, D. PAYNE and D. J. GREENLAND. Pore size distribution in critical point and freeze dried aggregates from clay subsoils . . 499

B. D. SOANE and J. K. HENSHALL. Spatial resolution and calibration characteristics of two narrow probe gamma-ray transmission systems for the measurement of soil bulk density *in situ* 517

E. TZIMAS. The measurement of soil-water hysteretic relationships on a soil monolith 529

W. A. RAHMAN and D. L. ROWELL. The influence of magnesium in saline and sodic soils: A specific effect or a problem of cation exchange? . . 535

H. ESWARAN. The alteration of plagioclases and augites under differing pedo-environmental conditions 547

J. C. HUGHES and G. BROWN. A crystallinity index for soil kaolins and its relation to parent rock, climate and soil maturity 557

R. S. CAMERON and A. M. POSNER. Mineralisable organic nitrogen in soil fractionated according to particle size 565

R. G. BARBER, T. R. MOORE and D. B. THOMAS. The erodibility of two soils from Kenya 579

H. M. KUNISHI, A. W. TAYLOR and J. C. VICKERS. Interpretation of phosphorus uptake by barley from acid soils using a diffusion model . . . 593

Number 4

J. A. CATT. Soils and Quaternary geology in Britain 607

E. R. PAGE. The effect of poly(vinyl alcohol) on the crust strength of silty soils 643

M. V. BRAUNACK, J. S. HEWITT and A. R. DEXTER. Brittle fracture of soil aggregates and the compaction of aggregate beds 653

B. T. BARNES and F. B. ELLIS. Effects of different methods of cultivation and direct drilling, and disposal of straw residues, on populations of earthworms 669

G. W. ROBERTSON and J. M. BRACEWELL. Rapid representative sampling of soil gases and their determination by mass spectrometry 681

S. R. POONIA, RAJ PAL and O. TALIBUDEEN. Diffuse double layer theory applied to Na-Ca exchange equilibria in temperate and semi-arid tropical soils 691

L. MADRID and A. M. POSNER. Desorption of phosphate from goethite 697

S. S. S. RAJAN. Adsorption of selenite, phosphate and sulphate on hydrous alumina 709

D. L. ROWELL and I. SHAINBERG. The influence of magnesium and of easily weathered minerals on hydraulic conductivity changes in a sodic soil 719

O. K. BORGGAARD. Selective extraction of amorphous iron oxides by EDTA from a Danish sandy loam 727

KUNAL GHOSH and M. SCHNITZER. UV and visible absorption spectroscopic investigations in relation to macromolecular characteristics of humic substances 735

K. M. GOH and MARY R. WILLIAMS. Changes in molecular weight distribution of soil organic matter during soil development 747

A. H. SINCLAIR. Availability of potassium to ryegrass from Scottish soils I. Effects of intensive cropping on potassium parameters 757

A. H. SINCLAIR. Availability of potassium to ryegrass from Scottish soils II. Uptake of initially non-exchangeable potassium 775

R. G. BARBER. Potassium fixation in some Kenyan soils 785

D. DE LA ROSA. Relation of several pedological characteristics to engineering qualities of soil 793